

(3) Geometric conversion

The mosaic image is long and narrow from north to south at Long. 68° W to 73° W and Lat. 35°30' S to 45°15' S. Therefore, map projection was made by using the UTM projection method which shows little distortion in the N-S direction. The central longitudinal line used was Zone 19 in which W69 is in the center. The spheroidal zone used was International 1909. Re-sampling was made by the first order extrapolation method and geometric conversion performed with 120 m/pixel.

2-2 Analysis and interpretation of satellite image

2-2-1 Purpose and scope of analysis

The purpose of this analysis is to make a photo-geological interpretation of the Landsat TM image data and analyze it with the existing data from the geological point of view in order to select promising areas based on the comprehensive examination of the acquired information on the present geological features, ore deposits and mineral occurrences.

The area covered by this analysis (hereafter called "the covered area") develops extensively from Lat. 35° S to Lat. 45° S from south to north along the Argentine and Chilean border as shown in Fig. II-2-1. The area is covered by 13 scenes of the Landsat TM image and is 250,000 km² in total.

2-2-2 Method of analysis

The photo-geological analysis and interpretation of satellite image data usually comprises the following five steps:

- (1) Preparation: Acquisition and orientation of the satellite data, and collection and review of the existing data of geology and ore deposit
- (2) Image processing of the satellite data
- (3) Photo-geological comprehensive interpretation: Preparation of comprehensive interpretation map and comparison with the existing data
- (4) Field check survey and re-interpretation based on it.
- (5) Report preparation

Of the above five steps, though Step (4) has been partly executed during the ground truth survey, but re-interpretation based on it has not been conducted.

The diagnostic criteria and their expression in the photo geology are as follows:

(A) Photo-characteristics

- Color tone: white, white gray, gray, blue gray, green gray, green, dark green, purple gray and brown, etc.
- Texture: fine grained, medium grained, coarse grained, smooth, etc.

(B) Morphological expression

- Drainage pattern: dendritic, parallel, latticed, plumous, etc.
- Drainage density: extremely low, low, moderate, high, extremely high.
- Rock resistance: extremely low, low, moderate, high, extremely high.
- Cross section: sloping geometry.
- Development of bedding: well developed, partially developed, massive, etc.

(C) Superficial cover

- Vegetation: dense, moderate, sparse.
- Cultivation: dense, moderate, sparse.

On the other hand, lineaments interpreted and extracted from the satellite image reflect on the surface or subsurface fractures, and in the photo-geological method are generally interpreted based on the recognition of the following topographical phenomena:

- (a) Presence of fault-scarp
- (b) Presence of linear and wide fault valleys
- (c) Cases where watercourse of a river shows significant linearity
- (d) Presence of kerncol and kernbut
- (e) Cases where points of inclination change on mountain slopes continue linearly.
- (f) Cases where moderate slope of sedimentary rock suddenly changes to steep slope in linear succession.
- (g) Cases of deviations in mountain ridges and river watercourses.
- (h) Drainage anomaly: Cases where gridded primary water streams are aligned linearly or cases of angular drainage system
- (i) Cases where lakes, hot springs, craters, springs, upwelling sites, collapses and landslide are located in alignment.
- (j) Cases of deviations in alluvial fan.
- (k) Cases where river terraces (usually flat) have vertical gaps or horizontal deviations with a linear boundary.